

(g) In the frequency bands 10.7-11.7 GHz and 11.7-12.2 GHz, the operational equivalent power-flux density, in the space-to-Earth direction, (operational EPFD_{down}) at any point on the Earth's surface, produced by actual operational emissions from the in-line co-frequency space station of a non-geostationary-satellite orbit (NGSO) system operating in the fixed-satellite service (FSS) shall not exceed the following operational limits for 100% of the time:

Operational limits to the EPFD _{down} radiated by non-GSO FSS systems in certain frequency bands ¹					
Frequency band (GHz) for International Allocations	EPFD _{down} dB(W/m ²)	Percentage of time during which EPFD _{down} may not be exceeded	Reference bandwidth (kHz)	Receive GSO earth station antenna diameter ² (m)	Orbital inclination of GSO satellite (degrees)
Prior to 31 December 2005: 10.7-11.7 in all Regions; 11.7-12.2 in Region 2; 12.2-12.5 in Region 3; and 12.5-12.75 in Regions 1 and 3	-163 -166 -167.5 -169.5	100	40	3 6 9 ≥ 18	≤ 2.5
	-160 -163 -164.5 -166.5	100	40	3 6 9 ≥ 18	> 2.5 and ≤ 4.5
From 31 December 2005: 10.7-11.7 in all Regions; 11.7-12.2 in Region 2; 12.2-12.5 in Region 3; and 12.5-12.75 in Regions 1 and 3	-161.25 -164 -165.5 -167.5	100	40	3 6 9 ≥ 18	≤ 2.5
	-158.25 -161 -162.5 -164.5	100	40	3 6 9 ≥ 18	> 2.5 and ≤ 4.5

¹ The operational limits on the EPFD_{down} radiated by non-GSO FSS systems shall be the values given in note 1 to the table in paragraph (d) or this table, whichever are the more stringent.

² For antenna diameters between the values given in this table, the limits are given by linear interpolation using a linear scale for EPFD_{down} in decibels and a logarithmic scale for antenna diameter in meters.

Note to paragraph g: These limits relate to the operational equivalent power flux-density which would be obtained under free-space propagation conditions, for all conditions, for all methods of modulation and for the specified inclined GSO FSS operations.

(h) In the frequency bands 12.75-13.15 GHz, 13.2125-13.25 GHz and 13.75-14.5 GHz, the equivalent power flux-density, in the Earth-to-space direction, ($EPFD_{up}$) produced at any point on the geostationary satellite orbit (GSO) by the emissions from all co-frequency earth stations in a non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system, for all conditions and for all methods of modulation, shall not exceed the following limits for the specified percentages of time limits:

Limits to the $EPFD_{up}$ radiated by NGSO FSS systems in certain frequency bands				
Frequency band (GHz) for International Allocations	$EPFD_{up}$ dB(W/m ²)	Percentage of time during which $EPFD_{up}$ may not be exceeded	Reference bandwidth (kHz)	Reference antenna beamwidth and reference radiation pattern ¹
12.5-12.75 12.75-13.25 13.75-14.5	-160	100	40	4° ITU-R S.672-4, L _s = -20

¹ For the case of L_s = -10, the values a = 1.83 and b = 6.32 should be used in the equations in the Annex of Recommendation ITU-R S.672-4 for single-feed circular beams. In all cases of L_s, the parabolic main beam equation should start at zero.

Note to paragraph h: These limits relate to the uplink equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(i) In the frequency bands 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3, 11.7-12.5 GHz in Region 1 and 12.2-12.7 GHz in Region 2, the single-entry equivalent power-flux density, in the space-to-Earth direction, ($EPFD_{down}$), at any point on the Earth's surface, produced by emissions from all co-frequency space stations of a single non-geostationary-satellite orbit (NGSO) system operating in the fixed-satellite service (FSS) shall not exceed the following limits for the given percentages of time:

Single-Entry EPFD_{down} limits for protection of 30, 45, 60, 90, 120, 180, 240 and 300 cm GSO BSS earth station antennas^{1, 2, 3}

Frequency band (GHz) for International Allocations	EPDF _{down} dB(W/m ²)	Percentage of time during which EPFD _{down} level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern ⁴
11.7-12.5 in Region 1; 11.7-12.2 and 12.5-12.75 in Region 3; 12.2-12.7 in Region 2	-165.841	0	40	30 cm Recommendation ITU-R BO.1443 Annex 1
	-165.541	25		
	-164.041	96		
	-158.6	98.857		
	-158.6	99.429		
	-158.33	99.429		
	-158.33	100		
	-175.441	0	40	45 cm Recommendation ITU-R BO.1443 Annex 1
	-172.441	66		
	-169.441	97.75		
	-164	99.357		
	-160.75	99.809		
	-160	99.986		
	-160	100		
	-176.441	0	40	60 cm Recommendation ITU-R BO.1443 Annex 1
	-173.191	97.8		
	-167.75	99.371		
	-162	99.886		
	-161	99.943		
	-160.2	99.971		
	-160	99.997		
	-160	100		
	-178.94	0	40	90 cm Recommendation ITU-R BO.1443 Annex 1
	-178.44	33		
	-176.44	98		
	-171	99.429		
	-165.5	99.714		
	-163	99.857		
	-161	99.943		
	-160	99.991		
	-160	100		

-182.44 -180.69 -179.19 -178.44 -174.94 -173.75 -173 -169.5 -167.8 -164 -161.9 -161 -160.4 -160	0 90 98.9 98.9 99.5 99.68 99.68 99.85 99.915 99.94 99.97 99.99 99.998 100	40	120 cm Recommendation ITU-R BO.1443 Annex 1
-184.941 -184.101 -181.691 -176.25 -163.25 -161.5 -160.35 -160 -160	0 33 98.5 99.571 99.946 99.974 99.993 99.999 100	40	180 cm ³ Recommendation ITU-R BO.1443 Annex 1
-187.441 -186.341 -183.441 -178 -164.4 -161.9 -160.5 -160 -160	0 33 99.25 99.786 99.957 99.983 99.994 99.999 100	40	240 cm ² Recommendation ITU-R BO.1443 Annex 1
-191.941 -189.441 -185.941 -180.5 -173 -167 -162 -160 -160	0 33 99.5 99.857 99.914 99.951 99.983 99.991 100	40	300 cm Recommendation ITU-R BO.1443 Annex 1

¹ For BSS antenna diameters 180 cm, 240 cm and 300 cm, in addition to the single-entry limits shown in this table, the following table for single-entry 100% of the time EPFD_{down} limits also applies in the frequency band listed:

Single-Entry EPFD _{down} limits radiated by non-GSO FSS systems at certain latitudes	
100% of the time EPFD _{down} dB(W/(m ² /40 kHz))	Latitude (North or South in degrees)
-160.0	$0 \leq \text{latitude} \leq 57.5$
$-160.0 + 3.4 * (57.5 - \text{latitude})/4$	$57.5 \leq \text{latitude} \leq 63.75$
-165.3	$63.75 \leq \text{latitude} $

² For 240 cm GSO BSS earth station antennas located in Alaska, communicating with GSO BSS satellites at the 91° W.L., 101° W.L., 110° W.L., 119° W.L. and 148° W.L. nominal orbital locations with elevation angles greater than 5°, -167 dB(W/(m²/40 kHz)) single-entry 100% of the time operational EPFD_{down} limit also applies to receive antennas.

³ For 180 cm GSO BSS earth station antennas located in Hawaii communicating with GSO BSS satellites that are operational as of December 30, 1999 at the 110° W.L., 119° W.L. and 148° W.L. nominal orbital positions, -162.5 dB(W/(m²/40 kHz)) single-entry 100% of the time operational EPFD_{down} limit also applies.

⁴ Under the section reference pattern of Annex 1 to Recommendation ITU-R BO.1443 shall be used only for the calculation of interference from non-GSO FSS systems into BSS systems.

Note to paragraph i: These limits relate to the equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(j) In the frequency bands 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3, 11.7-12.5 GHz in Region 1 and 12.2-12.7 GHz in Region 2, the aggregate equivalent power-flux density, in the space-to-Earth direction, (EPFD_{down}) at any point on the Earth's surface, produced by emissions from all co-frequency space stations of all non-geostationary-satellite orbit systems operating in the fixed-satellite service (FSS) shall not exceed the following limits for the given percentages of time:

Aggregate EPFD_{down} limits for protection of 30, 45, 60, 90, 120, 180, 240 and 300 cm GSO BSS earth station antennas^{1, 2, 3}

Frequency band (GHz) for International Allocations	EPFD _{down} dB(W/m ²)	Percentage of time during which EPFD _{down} level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ⁴
11.7- 12.5 GHz in Region 1; 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3; 12.2-12.7 GHz in Region 2	-160.4 -160.1 -158.6 -158.6 -158.33 -158.33	0 25 96 98 98 100	40	30 cm Recommendation ITU-R BO.1443 Annex 1
11.7-12.5 GHz in Region 1; 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3 12.2-12.7 GHz in Region 2	-170 -167 -164 -160.75 -160 -160	0 66 97.75 99.33 99.95 100	40	45 cm Recommendation ITU-R BO.1443 Annex 1
11.7-12.5 GHz in Region 1 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3 12.2-12.7 GHz in Region 2	-171 -168.75 -167.75 -162 -161 -160.2 -160 -160	0 90 97.8 99.6 99.8 99.9 99.99 100	40	60 cm Recommendation ITU-R BO.1443 Annex 1
11.7-12.5 GHz in Region 1 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3 12.2-12.7 GHz in Region 2	-173.75 -173 -171 -165.5 -163 -161 -160 -160	0 33 98 99.1 99.5 99.8 99.97 100	40	90 cm Recommendation ITU-R BO.1443 Annex 1
11.7-12.5 GHz in Region 1 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3 12.2-12.7 GHz in Region 2	-177 -175.25 -173.75 -173 -169.5 -167.8 -164 -161.9 -161 -160.4 -160	0 90 98.9 98.9 99.5 99.7 99.82 99.9 99.965 99.993 100	40	120 cm Recommendation ITU-R BO.1443 Annex 1

Frequency band (GHz)	EPFD _{down} dB(W/m ²)	Percentage of time during which EPFD _{down} level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ¹
11.7-12.5 GHz in Region 1; 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3; 12.2-12.7 GHz in Region 2	-179.5 -178.66 -176.25 -163.25 -161.5 -160.35 -160 -160	0 33 98.5 99.81 99.91 99.975 99.995 100	40	180 cm Recommendation ITU-R BO.1443 Annex 1
11.7-12.5 GHz in Region 1; 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3; 12.2-12.7 GHz in Region 2	-182 -180.9 -178 -164.4 -161.9 -160.5 -160 -160	0 33 99.25 99.85 99.94 99.98 99.995 100	40	240 cm Recommendation ITU-R BO.1443 Annex 1
11.7-12.5 GHz In Region 1; 11.7-12.2 GHz and 12.5-12.75 GHz In Region 3; 12.2-12.7 GHz In Region 2	-186.5 -184 -180.5 -173 -167 -162 -160 -160	0 33 99.5 99.7 99.83 99.94 99.97 100	40	300 cm Recommendation ITU-R BO.1443 Annex 1

¹ For BSS antenna diameters 180 cm, 240 cm and 300 cm, in addition to the aggregate limit shown in this table, the following table of aggregate 100% of the time EPFD_{down} limit also applies:

100% of the time EPFD _{down} dB(W/(m ² /40 kHz))	Latitude (North or South in degrees)
-160.0	$0 \leq \text{latitude} \leq 57.5$
$-160.0 + 3.4 (57.5 - \text{latitude})/4$	$57.5 \leq \text{latitude} \leq 63.75$
-165.3	$63.75 \leq \text{latitude} $

² For 240 cm GSO BSS earth station antennas located in Alaska, communicating with GSO BSS satellites at the 91° W.L., 101° W.L., 110° W.L., 119° W.L. and 148° W.L. nominal orbital locations with elevation angles greater than 5°, -167 dB(W/(m²/40 kHz)) aggregate 100% of the time operational EPFD_{down} limit also applies to receive antennas.

³ For 180 cm GSO BSS earth station antennas located in Hawaii communicating with GSO BSS satellites that are operational as of December 30, 1999 at the 110° W.L., 119° W.L. and 148° W.L. nominal orbital positions, -162.5 dB(W/(m²/40 kHz)) aggregate 100% of the time operational EPFD_{down} limit also applies.

⁴ Under the section reference pattern of Annex 1 to Recommendation ITU-R BO.1443 shall be used only for the calculation of interference from non-GSO FSS systems into GSO BSS systems.

Note to paragraph j: These limits relate to the equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

12. Section 25.209 is amended by revising paragraph (a) and adding new paragraph (h) to read as follows:

§ 25.209 Antenna performance standards.

(a) The gain of any antenna to be employed in transmission from an earth station in the geostationary satellite orbit fixed-satellite service (GSO FSS) shall lie below the envelope defined below:

* * * * *

(h) The gain of any antennas to be employed in transmission from a gateway earth station antenna operating in the frequency bands 10.7-11.7 GHz, 12.75-13.15 GHz, 13.2125-13.25 GHz, 13.8-14.0 GHz, and 14.4-14.5 GHz and communicating with NGSO FSS satellites shall lie below the envelope defined below:

$$\begin{array}{ll} 29 - 25\log_{10}(\theta) \text{ dBi} & 1^\circ \leq \theta < 36^\circ \\ -10 \text{ dBi} & 36^\circ \leq \theta \leq 180^\circ \end{array}$$

where θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator. For the purposes of this section, the peak gain of an individual sidelobe may not exceed the envelope defined above.

13. Section 25.212, the section heading is revised to read as follows:

§ 25.212 Narrowband transmissions in the 12/14 GHz GSO Fixed-Satellite Service.

* * * * *

14. Section 25.251 is amended by revising paragraphs (a) and (b).

§ 25.251 Special requirements for coordination.

(a) The administrative aspects of the coordination process are set forth in § 101.103 of this chapter in the case of coordination of terrestrial stations with earth stations, and in § 25.203 in the case of coordination of earth stations with terrestrial stations.

(b) The technical aspects of coordination are based on Appendix S7 of the International Telecommunication Union Radio Regulations and certain recommendations of the ITU Radiocommunication Sector (available at the FCC's Reference Information Center, Room CY-A257, 445 12th Street, SW., Washington, DC 20554).

15. Section 25.271 is amended by adding new paragraph (e).

§ 25.271 Control of transmitting stations.

* * * * *

(e) The licensee of an NGSO FSS system operating in the 10.7-14.5 GHz bands shall maintain an electronic web site bulletin board to list the satellite ephemeris data, for each satellite in the constellation,

using the North American Aerospace Defense Command (NORAD) two-line orbital element format. The orbital elements shall be updated at least once every three days.

APPENDIX B: FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act (RFA),¹ an Initial Regulatory Flexibility Analysis ("IRFA") was incorporated in the *Notice of Proposed Rule Making* ("NPRM") in ET Docket No. 98-206.² The Commission sought written public comment on the proposals in the *NPRM*, including comment on the IRFA. This Final Regulatory Flexibility Analysis ("FRFA") conforms to the RFA.³ In addition to the issues discussed below, the IRFA addressed Northpoint Technology Ltd.'s proposal to allow terrestrial operations to use the 12.2-12.7 GHz band for the provision of MVPD services and data services.

A. Need for, and Objectives of, the Report and Order

In this First Report and Order, we permit NGSO FSS operations in certain segments of the 10.7-14.5 GHz frequency band range, and adopt rules and policies to govern such operations. More specifically, we amend Parts 2 and 25 of our rules to permit NGSO FSS space-to-earth links ("downlinks") to operate in the 10.7-12.7 GHz band and for NGSO earth-to-space links ("uplinks") to operate in the 12.75-13.15 GHz, 13.2125-13.25 GHz and 13.8-14.5 GHz bands. These downlink bands are generally used by geostationary-satellite orbit ("GSO") FSS and fixed services. The uplink bands are used by GSO FSS operations, fixed services, mobile services, and Government operations. We also permit a new terrestrial Multichannel Video Distribution and Data Service (MVDDS) to operate in the 12.2-12.7 GHz band, but defer services and technical rules for the MVDDS to our companion Further Notice of Proposed Rule Making.

These new satellite and terrestrial operations can increase competition and provide new advanced services to the public. Specifically, NGSO FSS systems can provide new high-speed data services and offer additional competition to other satellite services, and terrestrial wireless and wireline services. The MVDDS can provide local television and data services and provide additional competition to both cable and Direct Broadcast Satellite (DBS) systems. There is, however, extensive use of the requested frequency bands in the United States and these incumbent operations provide important and valuable services to the public that we must protect. By this action, we provide for the introduction of new advanced services to the public, while permitting incumbent services to operate without harmful interference.

B. Summary of Significant Issues Raised by Public Comments In Response to the IRFA

No comments were submitted in response to the IRFA.

¹ See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 *et. seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

² See *Notice of Proposed Rule Making*, ET Docket No. 98-206, 14 FCC Rcd. 1131, 1194 (1998).

³ See 5 U.S.C. § 604.

C. Description and Estimate of the Number of Small Entities To Which Rules Will Apply

The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁴ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.⁵ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration ("SBA").⁶ A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."⁷

Regarding incumbent cable television operations in the 12.75-13.25 GHz band, the SBA has developed a definition of small entities for cable and other pay television services, which includes all such companies generating \$11 million or less in revenue annually. This definition includes cable systems operators, closed circuit television services, DBS services, multipoint distribution systems, satellite master antenna systems and subscription television services. According to the Census Bureau, there were 1,788 total cable and other pay television services and 1,423 had less than \$11 million in revenue.

The Communications Act also contains a definition of a small cable system operator, which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000." The Commission has determined that there are 61,700,000 subscribers in the United States. Therefore, we found that an operator serving fewer than 617,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all of its affiliates, do not exceed \$250 million in the aggregate. Based on available data, we find that the number of cable operators serving 617,000 subscribers or less totals 1,450. We did not request nor did we collect information concerning whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250,000,000, and thus are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

Regarding incumbent GSO FSS satellite use and the proposed NGSO FSS use in these requested bands, the Commission has not developed a definition of small entities applicable to geostationary or non-geostationary orbit fixed-satellite service applicants or licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to Communications Services, Not Elsewhere Classified. This definition provides that a small entity is one with \$11.0 million or less in annual receipts.⁸ According to Census Bureau data, there are 848 firms that fall

⁴ *Id.* § 601(6).

⁵ See 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

⁶ See Small Business Act, 15 U.S.C. § 632 (1996).

⁷ See 5 U.S.C. § 601(4).

⁸ See 13 C.F.R. § 121.201, Standard Industrial Classification (SIC) Code 4899.

under the category of Communications Services, Not Elsewhere Classified, which could potentially fall into the geostationary or non-geostationary orbit fixed-satellite service category. Of those, approximately 775 reported annual receipts of \$11 million or less and qualify as small entities.⁹ Generally, these NGSO and GSO FSS systems cost several millions of dollars to construct and operate. Therefore the NGSO and GSO FSS companies, or their parent companies, rarely qualify under this definition as a small entity.

Regarding Auxiliary, Special Broadcast and other program distribution services in the Ku-band. This service involves a variety of transmitters, generally used to relay broadcast programming to the public (through translator and booster stations) or within the program distribution chain (from a remote news-gathering unit back to the station). The Commission has not developed a definition of small entities applicable to Broadcast Auxiliary Station (BAS) licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radio broadcasting stations (SIC 4832) and television broadcasting stations (SIC 4833). These definitions provide, respectively, that a small entity is one with either \$5.0 million or less in annual receipts or \$10.5 million in annual receipts. 13 C.F.R. § 121.201, SIC Codes 4832 and 4833. There are currently 3,237 FM translators and boosters, and 2,964 TV translators. The FCC does not collect financial information on any broadcast facility and the Department of Commerce does not collect financial information on these auxiliary broadcast facilities. We believe, however, that most, if not all, of these auxiliary facilities could be classified as small businesses by themselves. We also recognize that most translators and boosters are owned by a parent station which, in some cases, would be covered by the revenue definition of small business entity discussed above. These stations would likely have annual revenues that exceed the SBA maximum to be designated as a small business (as noted, either \$5 million for a radio station or \$10.5 million for a TV station). Furthermore, they do not meet the Small Business Act's definition of a "small business concern" because they are not independently owned and operated.

Incumbent microwave services in the 10.7-11.7 GHz and 12.75-13.25 GHz bands include common carrier, private operational fixed, and BAS services. At present, there are 22,015 common carrier licensees, approximately 61,670 private operational fixed licensees and broadcast auxiliary radio licensees in the microwave services. Inasmuch as the Commission has not yet defined a small business with respect to microwave services, we will utilize the SBA's definition applicable to radiotelephone companies; *i.e.*, an entity with no more than 1,500 persons. 13 C.F.R. § 121.201, SIC Code 4812. We estimate, for this purpose, that all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition for radiotelephone companies.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

We will apply the Part 25 rules governing reporting requirements for NGSO FSS systems. Specifically, licensees are required to file an annual report with the Commission describing: the status of satellite construction and anticipated launch dates, including any major delays or problems encountered; a listing of any unscheduled satellite outages for more than 30 minutes including the cause(s) of any such outages; and a detailed description of the utilization made of each satellite on each of the in-orbit satellites.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The Commission adopts technical rules to facilitate spectrum sharing between new NGSO FSS systems in the Ku band and existing services in this spectrum. These technical rules are intended to allow new entrants into the spectrum without causing unacceptable interference to existing and future operations of

⁹ U.S. Bureau of Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, Utilities, UC92-S-1, Subject Series, Establishment and Firm Size, Table 2D, Employment Size of Firms: 1992, SIC Code 4899 (issued May 1995).

incumbent services. We acknowledge that as the radio spectrum is increasingly used, it becomes more difficult to accommodate all requests for access to the radio spectrum, however, this action applies existing frequency coordination procedures to NGSO FSS systems sharing spectrum with fixed services. Frequency coordination should ensure that new operations of either service will protect existing operations and have access to spectrum if it is technically possible.

The Commission also considered a proposal from the Fixed Service (FS) community to set aside some portion of the spectrum in the 10.7-11.7 GHz band for future FS deployment. The Commission declined this set aside because NGSO FSS and fixed systems should be able to coordinate operations and such an action would not lead to the most effective use of the spectrum. Additionally, in its comments and in a Petition for Rule Making, the fixed community requested that we change some aspects of the coordination and licensing procedures of FSS operations that share spectrum with fixed services. Because the issues raised by the fixed community address several spectrum bands which are not under consideration in this proceeding, we deferred on these issues to another proceeding that will address all these issues before NGSO FSS systems are licensed for this band.

Regarding sharing between NGSO FSS systems and broadcast auxiliary ("BAS") operations, the Report and Order states that it will adopt some form of geographic protection areas for terrestrial operations in those bands used by NGSO FSS gateway stations. These protection areas will be defined in a future proceeding, but are intended to facilitate the growth of terrestrial operations, while not unnecessarily hindering the deployment of NGSO FSS systems. Further, to ensure BAS operations in all areas can continue to operate unencumbered by new NGSO FSS systems, the Report and Order set aside 4 BAS channels for exclusive use in all areas to ensure continued operations.

Report to Congress: The Commission will send a copy of the Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, *see* 5 U.S.C. § 801(a)(1)(A). In addition, the Commission will send a copy of the Report and Order including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register. *See* 5 U.S.C. § 604(b).

APPENDIX C: NGSO FSS SYSTEM APPLICATIONS**Boeing****File No.: SAT-LOA-19990108-00006**

Boeing has filed an application for authority to launch and operate a global constellation of NGSO FSS satellites. The proposed Boeing system consists of a twenty-satellite constellation operating at a medium earth orbit of 20,182 kilometers. The constellation consists of four orbital planes with five satellites per plane, inclined 57 degrees relative to the equator. Boeing request authority to operate its NGSO FSS system within the 12.75-13.25 GHz and 13.75-14.5 GHz bands for uplinks and within the 10.7-12.7 GHz band for downlinks. Specifically, Boeing proposes to use 326 MHz of service uplink spectrum and 1000 MHz of service downlink spectrum. Boeing also requests 600 MHz of spectrum for feeder uplinks and 1000 MHz for feeder downlinks. Boeing proposes to provide "bandwidth on demand" communication and data services. In addition, Boeing requests a waiver of Section 2.106 of the Commission's Rules in order to provide, on a secondary, non-interference basis, ancillary two-way data transmission services to user terminals affixed to mobile platforms.

Hughes**File No.: SAT-LOA-19990108-00002**

Hughes has filed an application for authority to launch and operate a global Ku-band broadband satellite system called HughesLINK (H-LINK). The proposed system consists of twenty-two NGSO satellites, operating in medium-earth orbits at an altitude of 15,000 kilometers. Eight satellites are in an equatorial-plane and seven are each of two planes, inclined at 45 degrees. The proposed H-LINK system requests to operate in one gigahertz of spectrum within the 10.7-12.7 GHz band in Region 2 and the 10.7-12.75 GHz band in Regions 1 and 3 for downlinks and one gigahertz within the 12.75-13.25 GHz, 13.75-14.5, and 17.3-17.8 GHz (Regions 1 and 3 only) bands for uplinks. Inter-satellite links are proposed in optical frequency bands. H-LINK proposes to offer a wide variety of two-way, broadband services at data rates from 1.54 Mbps up to 155 Mbps, backbone infrastructure and Virtual Private Network.

Hughes**File No.: SAT-LOA-19990108-00003**

Hughes has filed an application for authority to launch and operate a global Ku-band broadband satellite system called HughesNET (H-Net). The proposed system consists of a seventy NGSO satellite constellation operating at an altitude of 1490 kilometers. The constellation consists of ten planes, with seven satellites each, inclined at 54.5 degrees. H-Net proposes to operate in one gigahertz of spectrum within the 10.7-12.7 GHz band in Region 2 and the 10.70-12.75 GHz band in Regions 1 & 3 for downlinks and one gigahertz within the 12.75-13.25 GHz, 13.75-14.5, and 17.3-17.8 GHz bands (Regions 1 & 3 only) for uplinks. Optical inter-satellite link terminals are proposed for inter-operation with other satellites in the H-Net constellation. H-Net proposes to offer Internet access and support to both packet-switched and circuit-switched operation.

SkyBridge**File Nos.: SAT-AMD-1998-0630-00056
SAT-AMD-19990108-00004**

SkyBridge has filed amendments to its pending applications for authority to launch and operate a global network of NGSO satellites. (See Public Notice, Report No. SPB-98, August 28, 1997 (accepting for filing the SkyBridge application, as amended by the 1997 Amendment); Public Notice, Report No. SPB-133, July 20, 1998 (accepting for filing the 1998 Amendment.) SkyBridge proposes several changes and clarifications to the SkyBridge application, as amended by the 1997 Amendment. SkyBridge, among other things, proposes to change the number of satellites in its system from sixty-four to eighty, revises its link budgets, revises frequency usage requirements and states it requires at least 2 GHz of contiguous spectrum for downlinks and at least 1.65 GHz for uplinks. SkyBridge also submitted a series of simulations that

SkyBridge claims demonstrates its amended system's ability to meet the relevant provisional power limits adopted at the WRC-97.¹⁰

Teledesic**File No.: SAT-LOA-19990108-0005**

Teledesic has filed an application for authority to construct, launch, and operate a global constellation of NGSO FSS satellites. Teledesic's proposed system, to be known as the Ku-Band Supplement (KuBS) system, will be comprised of thirty satellites, in six orbital planes with five satellites operating at an altitude of approximately 10,320 kilometers. Teledesic requests to operate its KuBS satellites in the 12.75-13.25 GHz, 13.75-14.5 GHz, and 17.3-17.8 GHz bands for uplinks and the 10.7-12.7 GHz bands for downlinks. Teledesic also proposes to operate a separate backup TT&C in standard C-band TT&C frequencies. Teledesic proposes to operate the KuBS constellation primarily as a high-bandwidth supplement to its Teledesic Network system authorized in the Ka-band (20/30GHz). Teledesic proposes to provide FSS on a primary basis but requests authority to provide MSS on an ancillary, non-interference basis.

Virgo**File No.: SAT-LOA-19990108-00007**

Virgo has filed an application for authority to launch and operate a global constellation of non-geostationary satellites operating in the FSS. The proposed system, VIRGO, consists of fifteen NGSO satellites operating in highly elliptical orbits operating at an altitude of 27,300 kilometers at apogee. Virgo proposes to operate with user uplinks in 14.0-14.5 GHz band and user downlinks in the 11.2-12.7 GHz band. Gateway links are proposed in the 12.75-13.25 GHz, 13.8-14.0 GHz, 17.3-17.8 GHz, and 5.925-6.725 GHz bands for uplinks and the 10.7-11.2 GHz and 3.7-4.2 GHz bands for downlinks. Inter-satellite links are proposed in optical frequency bands. Virgo proposes to provide high speed Internet access and direct-to-home data and video services to small user terminals in most areas of the world.

In addition, as noted in the *Ku-Band Cut-Off Notice*, the following two applications were filed in response to prior Bureau cut-off notices involving frequency bands different than those identified in the *Ku-band Cut-Off Notice*. One application was filed in response to the cut-off for applications to be considered in the 2 GHz band¹¹; the other application was filed in response to the cut-off for applications above 40 GHz.¹²

Denali**File Nos. 160-SAT-P/LA-97/13
SAT-AMEND-990108-00001**

Denali filed an application in response to the Commission's cut-off for additional space station applications and letters of intent in the 36-51.4 GHz Frequency Band. (See Public Notice No. Report No. SPB-89 (rel. July 22, 1997)). Denali requests authority to launch and operate thirteen satellites in highly elliptical orbit to provide FSS and MSS for domestic, international and foreign communications. In its initial application, Denali requested, among other things, 200 MHz for downlinks in the band 11.7-12.2 GHz in North America and 12.5-12.7 GHz in Europe and Asia. In response to the Commission's *Ku-Band Cut-Off Notice*, however, Denali amended its application to change some of its spectrum requirements. Specifically, Denali now requests 1000 MHz of spectrum in the 10.7-12.7 GHz band (preferably the band 11.7-12.7 GHz) for downlinks and 750 MHz for uplinks in the 13.75-14.5 GHz band.

¹⁰ By a Public Notice issued August 6, 1998, Report No. SPB-135, the Commission afforded interested parties a period of thirty days after the filing of these simulations within which to comment on its July 1998 Amendment. Submission of SkyBridge's most recent amendment, that included the simulations, effectively renders the August 6, 1998 Public Notice moot.

¹¹ Report No. SPB-88 (released July 22, 1997).

¹² *Id.*

APPENDIX D: COMMENTING PARTIES

Comments Filed March 2, 1999:

Association of American Railroads ("AAR")
Association of Local Television Stations, Inc
Boeing Company ("Boeing")
Comsearch
Denali Telecom, LLC ("Denali")
DIRECTV, Inc. ("DIRECTV")
EchoStar Communications Corporation ("EchoStar")
Fixed Point-to-Point Communications Section *et al.*
Fixed Wireless Communications Council ("FWCC")
GE American Communications, Inc. ("GE")
Global VSAT Forum
Home Box Office *et al.*
Hughes Communications, Inc. ("Hughes")
Loral Space and Communications Ltd. ("Loral")
National Association of Broadcasters
National Academy of Sciences' Committee on Radio Frequencies ("CORF")
Northpoint Technology, Ltd. ("Northpoint")
OpTel, Inc. ("OpTel")
PanAmSat Corporation *et al.* ("PanAmSat")
Petroleum Communications, Inc.
Qualcomm Incorporated ("Qualcomm")
Satellite Broadcasting and Communications Association
SBC Communications, Inc. ("SBC")
SkyBridge L.L.C. ("SkyBridge")
Society of Broadcast Engineers, Inc. ("SBE")
Sullivan, Thomas M.
Teledesic LLC ("Teledesic")
Telesat Canada
Tonga - Government of the Kingdom of
United States Satellite Broadcasting Company, Inc.
Virtual Geosatellite, L.L.C. ("Virgo")

Reply Comments Filed April 14, 1999:

Airtouch Communications, Inc.	PanAmSat
AAR	Petroleum Communications, Inc.
Boeing	SkyBridge
DIRECTV	SBE
Dominion Video Satellite, Inc.	Teledesic
EchoStar	United States Satellite Broadcasting Company, Inc.
EMS Technologies	Virgo
Fixed Point-to-Point Communications Section <i>et al.</i>	
FWCC	
GE	
Hughes	
LNR TrexCom Inc.	
Loral	
Northpoint	
OpTel	

APPENDIX E: PROPOSED RULES

For the reasons discussed in the preamble, the FCC proposes to amend 47 C.F.R. Part 101 as follows:

PART 101 - FIXED MICROWAVE SERVICES

1. The authority citation for Part 101 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303.

2. Section 101.3 is amended by adding a definition for MVDDS in alphabetical order to read as follows:

§ 101.3 Definitions.

* * * * *

Multichannel Video Distribution and Data Service (MVDDS). A microwave service licensed in the 12.2-12.7 GHz band that provides various wireless services.

3. Section 101.101 is amended by revising the entry for 12,200-12,700 MHz table to read as follows:

§ 101.101 Frequency availability.

Frequency band (MHz)	Radio Service				
	Common carrier (Part 101)	Private radio (Part 101)	Broadcast auxiliary (Part 74)	Other (Parts 15, 21, 24, 25, 74, 78 & 100)	Notes
* * * * *					
12,200-12,700.....	MVDDS	MVDDS, POFS		DBS, NGSO	
* * * * *					

* * * * *

3. Section 101.103(f) is revised to read as follows:

§101.103 Frequency coordination procedures.

* * * * *

(f) When the proposed facilities are to be operated in the band 12,200-12,700 MHz, licensees must follow the procedures, technical standards, and requirements of Section 101.105 in order to protect the stations authorized under Part 100.

4. Section 101.105 is amended by adding paragraph (a)(4) and (a)(5) and revising paragraph (d) by adding the phrase “for incumbent non-MVDDS stations” after the words “12,200-12,700 MHz band” to read as follows:

§101.105 Interference protection criteria.

* * *

OPTION ONE: (a)(4) MVDDS stations must operate on a non-harmful interference basis to Direct Broadcast Satellite (DBS) receivers. Interference to DBS receivers shall not increase the total outage of any system by more than 2.86% per year. Except for public safety entities, harmful interference protection from MVDDS stations to incumbent point-to-point 12 GHz fixed stations is not required. Incumbent point-to-point private operational fixed 12 GHz stations, except for public safety entities, are required to protect MVDDS stations under the process described in Section 101.103(d) of this subpart.

OPTION TWO: (a)(4) MVDDS stations must operate on a non-harmful interference basis to Direct Broadcast Satellite (DBS) receivers. Interference to DBS receivers shall not increase the total outage of any system by not more than 10 minutes in any given month. Except for public safety entities, harmful interference protection from MVDDS stations to incumbent point-to-point 12 GHz fixed stations is not required. Incumbent point-to-point private operational fixed 12 GHz stations, except for public safety entities, are required to protect MVDDS stations under the process described in Section 101.103(d) of this subpart.

(a)(5) All stations operating under this part must protect the radio quiet zones as required by Section 1.924 of the rules. Stations authorized by competitive bidding are cautioned that they must receive the appropriate approvals directly from the relevant quiet zone prior to operating.

* * * * *

(a)(5) All stations operating under this part must protect the radio quiet zones as required by Section 1.924 of the rules. Stations authorized by competitive bidding are cautioned that they must receive the appropriate approvals directly from the relevant quiet zone prior to operating.

* * * * *

5. Section 101.107 is amended by revising footnote 6 to the Table in paragraph (a) to read as follows:

§ 101.107 Frequency tolerance.

(a) * * *

(6) Applicable to private operations fixed point-to-point microwave stations and stations providing MVDDS service.

* * * * *

6. Section 101.109 is amended by revising the entry for 12,200-12,700 MHz and by adding footnote 8 in the Table at the end of the section to read as follows:

§101.109 Bandwidth.

* * * * *

(c) * * *

Frequency band (MHz)	Maximum authorized bandwidth
* * * *	* * *
12,200 to 12,700 ⁸	500 MHz
* * * *	* * *

* * *

⁸ For incumbent private operational fixed point-to-point stations in this band the maximum bandwidth shall be 20 MHz.

* * * * *

7. Section 101.113 is amended by revising the entry for 12,200-12,700 MHz in the table and adding a new footnote 10 to the table in paragraph (a) to read as follows:

§ 101.113 Transmitter power limitations.

(a) * * *

Frequency Band (MHz)	Maximum allowable EIRP ^{1,2}	
	Fixed (dBW)	Mobile (dBW)
* * * *	* * *	* * *
12,200 to 12,700 ¹⁰	+50
* * * *	* * *	* * *

* * *

¹⁰ The urban area eirp for MVDDS stations is limited to 12.5 dBm (-17.5 dBw) with two exceptions: (1) those MVDDS systems where the transmitter is mounted on a mountain ridge that is over one kilometer from populated subscriber areas may use a higher eirp up to +10 dBw, provided that the increase will not cause the system to exceed the "unavailability criteria" we develop and (2) MVDDS transmitting systems located on tall structures that are adjacent to bodies of water or other significant and clearly unpopulated areas, may use a higher eirp up to +10 dBw, provided that the increase will not cause the system to exceed the "unavailability criteria." Incumbent point-to-point stations may use up to +50 dBW except for low power systems licensed under Section 101.147(q).

* * * * *

8. Section 101.115 is amended by revising footnote 9 to the table in paragraph (c) to read as follows:

§101.115 Directional antennas.

* * *

(c) * * *

(9) Except for Temporary-fixed operations in the band 13200-13250 MHz with output powers less than 250 mW and as provided in Section 101.147(q), and except for receive antennas in the MVDDS service which shall only be required to have a minimum antenna gain of 34 dBi and may use circular or linear polarization.

* * * * *

9. Section 101.139 is amended by revising the last sentence of paragraph (a) to read as follows:

§ 101.139 Authorization of transmitters.

(a) * * * Transmitters designed for use in the 31.0-31.3 GHz band and transmitters designed for MVDDS use in the 12,200-12,700 MHz band will be authorized under the verification procedure.

* * * * *

11. Section 101.141 is amended by revising the first sentence of paragraph (a) to read as follows:

§ 101.141 Microwave modulation.

(a) Microwave transmitters employing digital modulation techniques and operating below 19.7 GHz must, with appropriate multiplex equipment, comply with the following additional requirements (except for MVDDS stations in the 12,200-12,700 MHz band):

12. Section 101.147 is amended by combining the entries in the frequency assignment table in paragraph (a) for 12,200-12,500 MHz and 12,500-12,700 MHz with a new footnote 28, adding a new sentence to the end of paragraph (p), and adding a new sentence to the beginning of paragraph (q) to read as follows:

§ 101.147 Frequency assignments.

(a) * * *

* * *

12,200-12,700 MHz (28)

* * *

(28) Frequencies in this band are shared with Direct Broadcast Satellites on a secondary non-harmful interference basis and on a co-primary basis with non-geostationary satellites and can be used only for incumbent private operational fixed point-to-point service on a site by site basis and MVDDS. Incumbent public safety licensees shall be afforded protection from MVDDS and NGSO licensees, however all other licensees shall be secondary to MVDDS and NGSO licensees.

* * *

(p) * * * The 12.2-12.7 GHz band is also authorized for MVDDS service on a non-harmful interference basis to DBS receivers in this band and on a co-primary basis with NGSO FSS stations.

OPTION ONE: (q) Applications for low power stations in the 12.2-12.7 GHz band are accepted. Existing stations are grandfathered subject to the following: * * *

OPTION TWO: (q) Applications for low power stations in the 12.2-12.7 GHz band are no longer accepted. Existing stations are grandfathered subject to the following: * * *

10. Section 101.601 is amended by adding a sentence at the end of the introductory paragraph to read as follows:

§ 101.601 Eligibility.

* * * This subpart shall not apply to stations offering MVDDS in the 12.2-12.7 GHz band.

* * * * *

11. A new proposed subpart of the rules under 101.1400 to read as follows:

**SUBPART P - MULTICHANNEL VIDEO DISTRIBUTION AND DATA SERVICE RULES
FOR THE 12.2-12.7 GHZ BAND**

Note: Because the Commission is seeking comment on various proposals in some instances, alternative text is shown under the relevant proposed section headings.

101.1401 Service areas.
101.1403 Must carry rules.
101.1405 Channeling plan.
101.1407 Permissible operations for MVDDS.
101.1409 Treatment of incumbent licensees.
101.1411 Regulatory status and eligibility.
101.1413 License term and renewal expectancy.
101.1415 Partitioning and disaggregation.
101.1417 Annual report.
101.1421 Coordination of adjacent area MVDDS stations.
101.1423 Canadian and Mexican coordination.
101.1425 RF safety.
101.1427 Over-the-air reception devices rules (OTARD).
101.1437 MVDDS licenses subject to competitive bidding.
101.1438 Designated entities.

§ 101.1401 Service areas.

OPTION ONE: Multichannel Video Distribution and Data Service (MVDDS) is licensed on the basis of geographic areas. Each geographic area shall be licensed to one licensee.

OPTION TWO: Multichannel Video Distribution and Data Service (MVDDS) is licensed on a site-by-site basis.

§ 101.1403 Must carry rules.

OPTION ONE: Licensees are required to provide all local television channels to subscribers within its area. If a license is partitioned, all relevant parties must provide every customer with all the local

television channels in the entire area, not a portion thereof. MVDDS licensees are required to comply with the must-carry rules. *See* Multichannel Video and Cable Television Service Rules, Subpart D (Carriage of Television Broadcast Signals), 47 C.F.R. §§ 76.51-76.70.

OPTION TWO: Licensees are not required to provide all local television channels to subscribers within its area. MVDDS licensees are not required to comply with the must-carry rules. *See* Multichannel Video and Cable Television Service Rules, Subpart D (Carriage of Television Broadcast Signals), 47 C.F.R. §§ 76.51-76.70.

§ 101.1405 Channeling plan.

OPTION ONE: Each license shall have one spectrum block of 500 megahertz per geographic area that can be divided into any size channels and should provide various digital wireless services to subscribers. Disaggregation is not allowed.

OPTION TWO: Each license shall have one spectrum block of 500 megahertz per geographic area that can be divided into any size channels and should provide various digital wireless services to subscribers. Disaggregation is allowed.

§ 101.1407 Permissible operations for MVDDS.

MVDDS licensees must use spectrum in the 12.2-12.7 GHz band for digital fixed one-way direct-to-home/office wireless service. Mobile and aeronautical services are not authorized. Two-way services may be provided by using other spectrum or media for the return path.

§ 101.1409 Treatment of incumbent licensees.

Terrestrial point-to-point licensees in the 12.2-12.7 GHz band which were licensed prior to MVDDS or NGSO satellite stations are incumbent point-to-point stations and are not entitled to protection from harmful interference caused by later MVDDS or NGSO FSS entrants in the 12.2-12.7 GHz band, except for public safety stations which must be protected. MVDDS and NGSO FSS operators have the responsibility of resolving any harmful interference problems that their operations may cause to these incumbent point-to-point operations in the 12.2-12.7 GHz band. Incumbent public safety terrestrial point-to-point licensees may only make minor changes to their stations without losing this protection. This does not relieve current point-to-point licensees of their obligation to protect BSS operations in the subject frequency band. Point-to-point applications for new licenses, major amendments, or major modifications for the 12.2-12.7 GHz band are no longer accepted, including low-power operations.

§ 101.1411 Regulatory status and eligibility.

OPTION ONE: (a) MVDDS licensees are allowed to provide one-way video programming and data services on a non-common carrier basis. MVDDS is not treated as a common carrier service and is prohibited from providing switched voice and data services.

OPTION TWO: (a) MVDDS licensees are allowed to provide one-way video programming and data services on a non-common carrier basis. MVDDS is treated as a common carrier service and is permitted to provide switched voice and data services.

(b) MVDDS licensees in the 12.2-12.7 GHz band are subject to the requirements set forth in Section 101.7 of the Commission's Rules.

§ 101.1413 License term and renewal expectancy.

(a) The MVDDS license term is ten years, beginning on the date of the initial authorization grant.

(b) Application of a renewal expectancy is based on the substantial service requirement which we define as a service that is sound, favorable, and substantially above a level of mediocre service which might minimally warrant renewal. At the end of the license term, the Commission will consider factors such as:

(1) whether the licensee's operations service niche markets or focus on serving populations outside of areas serviced by other licensees;

(2) whether the licensee's operations serve populations with limited access to telecommunications services; and

(3) a demonstration of service to a significant portion of the population or land area of the licensed area.

(c) The renewal application of a MVDDS licensee must include the following showings in order to claim a renewal expectancy:

(1) a coverage map depicting the served and unserved areas;

(2) a corresponding description of current service in terms of geographic coverage and population served or links installed in the served areas; and

(3) copies of any Commission Orders finding the licensee to have violated the Communications Act or any Commission rule or policy and a list of any pending proceedings that relate to any matter described by the requirements for the renewal expectancy.

§ 101.1415 Partitioning and disaggregation.

OPTION ONE: MVDDS operators are allowed to partition licensed geographic areas. Disaggregation will be permitted by MVDDS licensees in the 12.2-12.7 GHz band. "Partitioning" is the assignment of geographic portions of a license along geopolitical or other boundaries. "Disaggregation" is the assignment of discrete portions or "blocks" of spectrum licensed to a geographic licensee or qualifying entity.

OPTION TWO: MVDDS operators are allowed to partition licensed geographic areas. Disaggregation will not be permitted by MVDDS licensees in the 12.2-12.7 GHz band. "Partitioning" is the assignment of geographic portions of a license along geopolitical or other boundaries. "Disaggregation" is the assignment of discrete portions or "blocks" of spectrum licensed to a geographic licensee or qualifying entity.

§ 101.1417 Annual report.

Each MVDDS licensee shall file with the Commission two copies of a report by March 1 of each year for the preceding calendar year. This report must include the following:

(1) name and address of licensee;

(2) station(s) call letters and primary geographic service area(s); and

(3) the following statistical information for the licensee's station (and each channel thereof):

(i) the total number of separate subscribers served during the calendar year;

(ii) the total hours of transmission service rendered during the calendar year to all subscribers;

(iii) the total hours of transmission service rendered during the calendar year involving the transmission of local broadcast signals; and

(iv) a list of each period of time during the calendar year in which the station rendered no service as authorized, if the time period was a consecutive period longer than 48 hours.

§ 101.1421 Coordination of adjacent area MVDDS stations.

MVDDS licensees in the 12.2-12.7 GHz band are required to develop sharing and protection agreements based on the design and architecture of their systems, in order to ensure that no harmful interference occurs within the same geographic area or between adjacent licensees or between adjacent areas.

§ 101.1423 Canadian and Mexican coordination.

Pursuant to Section 2.301 of this part, MVDDS systems in the United States within 56 km (35 miles) of the Canadian and Mexican border are granted conditional licenses, until final international agreements are approved. These systems may not cause harmful interference to stations in Canada or Mexico.

§ 101.1425 RF safety.

Stations with output powers that equal or exceed 1640 watts eirp will be subject to the routine environmental evaluation rules for radiation hazards, as set forth in Section 1.1307 of this part.

§ 101.1427 Over-the-air reception devices rule (OTARD).

The Over-the-Air Reception Devices Rule (OTARD) in Section 1.4000 of this part shall apply to the receive-only MVDDS antennas at subscribers' homes or offices.

§ 101.1437 MVDDS licenses subject to competitive bidding.

Mutually exclusive initial applications for MVDDS licenses in the 12.2-12.7 GHz band are subject to competitive bidding procedures. The procedures set forth in part 1, subpart Q, of this chapter will apply unless otherwise provided in this part.

§ 101.1438 Designated entities.**(a) Eligibility for small business provisions.**

(1) A very small business is an entity that, together with its controlling interests and affiliates, has average annual gross revenues not exceeding \$3 million for the preceding three years.

(2) A small business is an entity that, together with its controlling interests and affiliates, has average annual gross revenues not exceeding \$15 million for the preceding three years.

(3) An entrepreneur is an entity that, together with its controlling interests and affiliates, has average annual gross revenues not exceeding \$40 million for the preceding three years.

(4) For purposes of determining whether an entity meets any of the definitions set forth in paragraphs (a)(1), (a)(2), or (a)(3) of this section, the gross revenues of the entity, its controlling interests and affiliates shall be considered in the manner set forth in § 1.2110(b) and (c) of this chapter.

(5) A consortium of very small businesses is a conglomerate organization formed as a joint venture between or among mutually independent business firms, each of which individually satisfies the definition in paragraph (a)(1) of this section. A consortium of small businesses is a conglomerate organization formed as a joint venture between or among mutually independent business firms, each of which individually satisfies the definition in paragraph (a)(2) of this section. A consortium of entrepreneurs is a conglomerate organization formed as a joint venture between or among mutually independent business firms, each of which individually satisfies the definition in paragraph (a)(3) of this section. Where an applicant or licensee is a consortium of small businesses (or very small businesses or entrepreneurs), the gross revenues of each small business (or very small business or entrepreneur) shall not be aggregated.

(b) **Bidding credits.** A winning bidder that qualifies as a very small business or a consortium of very small businesses as defined in this section may use the bidding credit specified in § 1.2110(f)(2)(i) of this

chapter. A winning bidder that qualifies as a small business or a consortium of small businesses as defined in this section may use the bidding credit specified in § 1.2110(f)(2)(ii) of this chapter. A winning bidder that qualifies as an entrepreneur or a consortium of entrepreneurs as defined in this section may use the bidding credit specified in § 1.2110(f)(2)(iii) of this chapter.

APPENDIX F – INITIAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act (RFA),¹³ the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in this Further Notice of Proposed Rule Making (*FNPRM*). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *FNPRM* provided above in paragraph 346. The Commission will send a copy of the *FNPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration. See 5 U.S.C. §603(a). In addition, the *FNPRM* and IRFA (or summaries thereof) will be published in the Federal Register. See *id.*

A. Need for, and Objectives of, the Proposed Rules

This rule making is being initiated to adopt licensing, service and technical rules for the Multichannel Video Data and Distribution Service (MVDDS) at 12.2-12.7 GHz. Our objectives are: (1) to accommodate the introduction of innovative services; and (2) to facilitate the sharing and efficient use of spectrum.

B. Legal Basis for Proposed Rules

The proposed action is authorized under the Administrative Procedure Act, 5 U.S.C. § 553; and Sections 1, 4(i), 7, 301, 303, 308 and 309(j) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 157, 301, 303, 308 and 309(j).

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”¹⁴ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.¹⁵ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business

¹³ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601 *et. seq.*, has been amended by the Contract With America Advancement Act of 1996 Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

¹⁴ 5 U.S.C. § 601(6).

¹⁵ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.” 5 U.S.C. § 601(3).

Administration (SBA).¹⁶ A small organization is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹⁷

The definition of small entity under the SBA rules for the radiotelephone industry provides that a small entity is a radiotelephone company employing fewer than 1,500 persons.¹⁸ The 1992 Census of Transportation, Communications, and Utilities, conducted by the Bureau of the Census, which is the most recent information available, shows that only 12 radiotelephone firms out of a total of 1,178 such firms that operated during 1992 had 1,000 or more employees.¹⁹ As of 1992, there were approximately 275,801 small organizations nationwide.²⁰ The definition of “small governmental jurisdiction” is one with populations of fewer than 50,000.²¹ There are 85,006 governmental jurisdictions in the nation.²² This number includes such entities as states, counties, cities, utility districts and school districts. There are no figures available on what portion of this number has populations of fewer than 50,000. However, this number includes 38,978 counties, cities and towns, and of those, 37,556, or 96 percent, have populations of fewer than 50,000.²³ The Census Bureau estimates that this ratio is approximately accurate for all government entities. Thus, of the 85,006 governmental entities, we estimate that 96 percent, or about 81,600, are small entities that may be affected by our rules.

The proposed rules will affect all entities that intend to provide terrestrial MVDDS operations in the 12.2-12.7 GHz band. In the *FNPRM*, the Commission seeks comment on whether to permit MVDDS licensees to use spectrum in the 12.2-12.7 GHz band for fixed one-way direct-to-home/business video and data services, as well as other types of services to which the spectrum may be used. The Commission states that it envisions the use of this spectrum for video service, but concedes that it does not know precisely the other types of services that licensees may seek to provide.

If an auction is conducted for MVDDS, the Commission proposes to define three tiers of small businesses for the purpose of providing bidding credits to small entities. The Commission proposes to define the three tiers of small businesses as follows: an “entrepreneur” would be an entity with average annual gross revenues not exceeding \$40 million for the preceding three years; a “small business” would be an entity with average annual gross revenues not exceeding \$15 million for the preceding three years; and a “very small business” would be an entity with average annual gross revenues not exceeding \$3 million for the preceding three years. The Commission will not know how many auction participants or licensees will qualify under these proposed definitions as entrepreneurs, small businesses, or very small businesses unless and until an auction is held. Even after that, the Commission will not know how many

¹⁶ Small Business Act, 15 U.S.C. § 632 (1996).

¹⁷ 5 U.S.C. § 601(4).

¹⁸ See 13 C.F.R. § 121.201, Standard Industrial Classification (SIC) Code 4812.

¹⁹ U.S. Bureau of the Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, and Utilities, UC92-S-1, Subject Series, Establishment and Firm Size, Table 5, Employment Size of Firms: 1992, SIC Code 4812 (issued May 1995).

²⁰ 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the SBA).

²¹ 5 U.S.C. § 601(5).

²² 1992 Census of Governments, U.S. Bureau of the Census, U.S. Department of Commerce.

²³ *Id.*

licensees will partition their license areas or disaggregate their spectrum blocks, if partitioning and disaggregation are allowed. In view of our lack of knowledge about the entities that will seek MVDDS licenses, we assume that, for purposes of our evaluations and conclusions in the IRFA, all prospective licensees are entrepreneurs, small businesses, or very small businesses under our proposed definitions. We invite comment on this analysis.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

Applicants for MVDDS licenses may be required to submit applications. If an auction is held, applicants will be required under our proposed rules to submit an FCC Form 175 short-form application prior to the auction, and auction winners will be required to file an FCC Form 601 license application. Additionally, the Commission proposes to require the filing of certain documents (*e.g.*, coverage maps) to substantiate renewal expectancies with information demonstrating substantial service upon license renewal. We request comment on how these proposed requirements can and/or should be modified to reduce the burden on small entities and still meet the objectives of the proceeding.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

We have reduced burdens wherever possible. To provide opportunities for small entities to participate in any auction that is held, we propose to provide bidding credits for entrepreneurs, small businesses, and very small businesses as defined in Section C of this IRFA. The bidding credits proposed are 15 percent for entrepreneurs, 25 percent for small businesses, and 35 percent for very small businesses. In the *FNPRM*, the Commission seeks comment on its proposed small business definitions and bidding credits, thus providing interested parties with an opportunity to suggest alternatives. Our proposed partitioning and disaggregation rules are also intended to help small entities acquire licenses. The regulatory burdens we have retained are necessary in order to ensure that the public receives the benefits of innovative new services in a prompt and efficient manner. We will continue to examine alternatives in the future with the objectives of eliminating unnecessary regulations and minimizing any significant economic impact on small entities. We seek comment on significant alternatives commenters believe we should adopt.

F. Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rules

None.

APPENDIX G – EXAMPLES OF DBS SERVICE OUTAGES FOR DIFFERENT PERCENTAGES OF SERVICE UNAVAILABILITY (45 cm antenna)

Table 1 EchoStar @ 119 WL					
DBS satellite orbital location	degrees	119.0	119.0	119.0	119.0
Earth station location		Denver, CO	Washington, D.C.	Seattle, WA	Miami, FL
DBS satellite e.i.r.p. towards the Earth station location	dBW	48.8	52.6	46.7	52.6
Earth station elevation above mean sea level	mm	1.58	0.01	0.01	0.0
Earth station elevation angle	degrees	41.8	27.6	35.2	37.7
Free space loss	dB	205.9	206.1	206.0	205.9
Earth station antenna miss-pointing error	dB	0.5	0.5	0.5	0.5
Atmospheric absorption	dB	0.2	0.2	0.2	0.2
Clear-sky receive system noise temperature	Kelvin	85	85	85	85
Clear-sky earth station antenna G/T	dB	14.5	14.5	14.5	14.5
C/I for other assignments in the BSS Plan	dB	20.0	20.0	20.0	20.0
Clear-sky feeder link C/(N+I)	dB	26.2	26.2	26.2	26.2
Clear-sky carrier-to-noise plus interference ratio	dB	10.7	13.6	8.9	13.7
Required C/(N+I) for operating threshold	dB	6.1	6.1	6.1	6.1
Link margin	dB	4.6	7.5	2.8	7.7
Rain margin	dB	1.82	4.1	0.93	4.22
Rain intensity exceeded for 0.01% of an average year	mm/h	30.3	48.2	36.1	95.7
Satellite link availability for an average year	%	99.98	99.92	99.71	99.59
Satellite link unavailability for an average year	%	0.0207	0.0843	0.2873	0.4120
Total link unavailable time for an average year	minutes	108.8	443.1	1510	2165.5
10% of the unavailable time in an average year	minutes	10.9	44.3	151.0	216.6
5% of the unavailable time in an average year	minutes	5.4	22.2	75.5	108.3
2.86% of the unavailable time in an average year	minutes	3.1	12.7	43.2	61.9
Satellite link unavailability for the worst-month	%	0.0978	0.3316	0.9361	1.3177
Total link unavailable time for the worst-month	minutes	42.8	145.2	421.8	577.1
10% of the unavailable time in the worst-month	minutes	4.3	14.5	42.2	57.7
5% of the unavailable time in the worst-month	minutes	2.1	7.26	21.1	28.9
2.86% of the unavailable time in the worst-month	minutes	1.2	4.2	12.1	16.5
Rainy sky C/I for a 2.86% increase in link unavailability	dB	24.2	22.9	25.0	22.3

Table 2 DIRECTV @ 101 WL					
DBS satellite orbital location	degrees	101.0	101.0	101.0	101.0
Earth station location		Denver, CO	Washington, D.C.	Seattle, WA	Miami, FL
DBS satellite e.i.r.p. towards the Earth station location	dBW	49.4	52.4	48.4	53.4
Earth station elevation above mean sea level	km	1.58	0.01	0.01	0.0
Earth station elevation angle	degrees	43.8	38.5	31.5	52.0
Free space loss	dB	205.8	205.9	206.0	205.7
Earth station antenna miss-pointing error	dB	0.5	0.5	0.5	0.5
Atmospheric absorption	dB	0.2	0.2	0.2	0.2
Clear-sky receive system noise temperature	Kelvin	125	125	125	125
Clear-sky earth station antenna G/T	dB	12.9	12.9	12.9	12.9
C/I for other assignments in the BSS Plan	dB	20.7	20.7	20.7	20.7
Clear-sky feeder link C/(N+I)	dB	24.2	24.2	24.2	24.2
Clear-sky carrier-to-noise plus interference ratio	dB	10.0	12.4	8.9	13.3
Required C/(N+I) for operating threshold	dB	5.0	5.0	5.0	5.0
Link margin	dB	5.0	7.4	3.9	8.3
Rain margin	dB	2.47	4.47	1.76	5.42
Rain intensity exceeded for 0.01% of an average year	mm/h	30.3	48.2	36.1	95.7
Satellite link availability for an average year	%	99.99	99.96	99.88	99.82
Satellite link unavailability for an average year	%	0.0104	0.0418	0.1186	0.1758
Total link unavailable time for an average year	minutes	54.7	219.7	623.4	924.0
10% of the unavailable time in an average year	minutes	5.5	22.0	62.3	92.4
5% of the unavailable time in an average year	minutes	2.7	11.0	31.2	46.2
2.86% of the unavailable time in an average year	minutes	1.6	6.3	17.8	26.4
Satellite link unavailability for the worst-month	%	0.0537	0.1802	0.4462	0.6283
Total link unavailable time for the worst-month	minutes	23.5	78.9	195.4	275.2
10% of the unavailable time in the worst-month	minutes	2.4	7.9	19.5	27.5
5% of the unavailable time in the worst-month	minutes	1.2	3.9	9.8	13.8
2.86% of the unavailable time in the worst-month	minutes	0.7	2.3	5.6	7.9
Rainy sky C/I for a 2.86% increase in link unavailability	dB	23.5	22.1	23.6	21.3

APPENDIX H -- A METHOD OF CONVERTING PERCENTAGE OF UNAVAILABLE TIME INTO A CARRIER-TO-INTERFERENCE RATIO

This appendix presents a method for determining the relationship between DBS service outage time and a DBS system's carrier-to-noise plus interference ratio (C/N+I). Specifically, this method can be used to determine the C/I that a terrestrial system needs to meet in relation to a DBS satellite system to keep service disruptions of the satellite system to a certain amount of outage time. In this case the terrestrial system represents the interference and the satellite system represents the desired carrier.

The availability of a satellite space-to-Earth link is defined as the total amount of time that the satellite service is available to the user without disruption. Conversely, the unavailability of that same link is the total time during which the user is without service (outage). Generally, availability and unavailability are expressed in terms of percentage of time of an average year (8766 hours) or the worst month in an average year.²⁴ These two variables are complementary and always sum to 100 percent. For example if a satellite system has an availability of 99.7%, its unavailability is 0.3% which equates to total outage time of 26.3 hours averaged over a year.

In a shared environment (satellite and terrestrial service), the total unavailability can be attributed to two sources: natural propagation phenomenon such as precipitation (*e.g.*, rain) in the space-to-earth path and external radio interference. In the frequency bands used by DBS for downlink (12.2-12.7 GHz), the predominant propagation impairment is rain attenuation in the space-to-earth slant path.²⁵ The amount of service outage caused by rain can be estimated using the prediction procedures of ITU-R Recommendation P.618-6. This rain attenuation model predicts, for a given geographic area, the average service outage time over an average year for a specific level of precipitation attenuation along the space-to-earth slant path.

To determine the portion of the total C/I that is attributable to a terrestrial system, we first establish the amount of outage time of the DBS space-to-earth link that is caused by precipitation only. This outage time is directly dependent on the link margin of the space-to-earth link, which is calculated from the system's link power budget. Link margin is the amount of power received at the earth station receiver above its operating threshold that is designed into the satellite link to overcome the effects of rain and other impediments. During rain, the satellite link is affected in two ways: the carrier signal strength is attenuated due to rain and the rain causes an increase in the system's noise temperature. If the rain attenuation and earth station G/T (gain / system noise temperature) degradation cause a reduction to the carrier-to-noise (C/N) power that exceeds the available link margin, the satellite link will experience an outage. The amount of attenuation due to rain that causes an outage is referred to as the rain margin.

The satellite link budget (carrier-to-noise plus interference ratio) and the associated rain margin can be derived from the parameters identified in Table B-1. It is evident from the table that the rain margin depends on the DBS satellite E.I.R.P. in the direction of the receiving earth station, the free space path loss, the earth station antenna gain-to-system noise temperature (G/T) ratio and the operating threshold. Once the link margin is known, one can proceed to determine the rain margin. This is accomplished by adding a rain attenuation term to the equation used to find the clear-sky carrier-to-noise ratio to instead find a rainy-sky carrier-to-noise ratio. Additionally, the G/T must be recalculated to

²⁴ A method for converting annual statistics to worst-month statistics is contained in Recommendation ITU-R P.841-1, *Conversion Of Annual Statistics To Worst-Month Statistics*.

²⁵ In this analysis, we omitted the uplink (earth-to-space) outage contribution.

account for the increase in atmospheric noise due to the rain. Thus, the G/T will be reduced during a rain event and the rain margin will be less than the link margin.

Once the rain margin is determined, the expected outage time of a satellite link in an average year or in the worst month can be computed using the prediction method contained in ITU-R Recommendation P.618-6. This recommendation entitled "Propagation Data and Prediction Method required for the Design of Earth-Space Telecommunication Systems" provides a procedure to estimate the long-term statistics of the space-to-earth path precipitation attenuation and the associated percentage of outage time.

Now that the percentage of outage time due solely to rain is known, we can reverse the procedure to determine the minimum C/I that a terrestrial system must maintain to effect a specific amount of additional outage time on the satellite system. First, the additional outage time must be determined, either as a percentage of additional outage time or a number of minutes per time period. This additional outage time can then be added to the outage time due to rain only to find the 'equivalent unavailability.' For example, if a satellite space-to-earth link has an unavailability of 0.3% and the minimum C/I for the terrestrial system to cause no more than an additional 10% outage is to be determined, the equivalent unavailability would be 0.33% ($0.3 * 1.1$). Using the equivalent unavailability, the ITU rain model can be used to find the corresponding 'equivalent rain margin.' That is, the ITU model can be used to find the amount of attenuation associated with the increased outage time. This change in attenuation is attributed to interference from the terrestrial system.

The C/I for the terrestrial system can now be found by modifying the methodology used to determine the satellite link budget (carrier-to-noise plus interference ratio). The terrestrial system is factored into the link budget by adding a term representing its C/I. By using the equivalent rain margin in the link budget, we find an 'equivalent link margin.' We can then find the C/I of the terrestrial system that causes the reduction of the equivalent link margin to zero. This is the minimum C/I that the terrestrial system must maintain to cause no more than the amount of additional outage time chosen.

It is important to note that the above methodology results in the rainy-sky C/I for the terrestrial service interference, which would produce the additional outage time at the DBS earth station. The reason for calculating the rainy-sky C/I is based on the assumption that in a typical satellite path, rain cells in the space-to-earth slant path are generally to the south of the earth station location. Because the terrestrial interfering path generally emanates from the north of the DBS earth station location, it will usually not be in the rain cell. Thus, at the time when a rain cell in the space-to-earth path attenuates a DBS signal, the terrestrial signal will not similarly be attenuated. Therefore, the calculated C/I is performed by not fading the terrestrial signal with rain.

Table B-2 provides an example of the process described above.

Table B-1: Required Parameters for the Determination of DBS Link Rain Margin and Satellite Link Availability and Unavailability

Input Parameters:

1. Satellite longitude;
2. Earth station location (latitude and longitude);
3. Earth station altitude above mean sea level (AMSL);
4. Satellite E.I.R.P. in the direction of the DBS earth station;
5. The operating frequency;
6. The required operating threshold for the DBS earth station receiver;
7. Receiver noise bandwidth;
8. Earth station antenna diameter;
9. Earth station antenna pointing loss towards the DBS satellite;
10. Clear-sky earth station system noise temperature;
11. Atmospheric absorption;
12. Carrier-to-interference ratio from other assignments in the BSS plan;
13. Clear-sky feeder link carrier-to-interference ratio;
14. Boltzman's constant.

Calculation method:

- (A) Calculate the distance and elevation angle between satellite and earth station using the satellite longitude (1) and the earth station location (2).
- (B) Calculate the free space transmission loss using the distance (A) and the operating frequency (5).
- (C) Calculate DBS antenna gain using the operating frequency (5) and the earth station antenna diameter (8).
- (D) Calculate the clear-sky G/T ratio using the antenna gain (C) and the clear-sky earth station system noise temperature (10).
- (E) Calculate the clear-sky carrier-to-noise ratio using the E.I.R.P. (4), free space transmission loss (B), earth station antenna pointing loss (9), clear-sky G/T (D), receiver noise bandwidth (7), Boltzman's constant (14) and atmospheric absorption (11).
- (F) Calculate the clear-sky carrier-to-noise plus interference ratio using the clear-sky carrier-to-noise ratio (E), the carrier-to-interference ratio from other assignments in the BSS plan (12), and the clear-sky feeder link carrier-to-interference ratio (13)
- (G) Calculate the link and rain margins using the clear-sky carrier-to-noise plus interference ratio (F) and the operating threshold (6).
- (H) Calculate the satellite link unavailability using ITU-R Recommendation P.618-6, the rain margin (G), earth station location (2), earth station elevation angle (A), AMSL (3), and operating frequency (5).
- (I) Determine the acceptable increase in unavailability due to terrestrial service interference and calculate equivalent unavailability of the satellite by adding the satellite link unavailability (H) and the increase in unavailability due to terrestrial interference.
- (J) Determine the equivalent rain margin using the equivalent unavailability (I) and ITU-R Recommendation P.618-6.
- (K) Determine the C/I for the terrestrial interference using the equivalent rain margin (J) in the step (G) calculation.

Table B-2: An Example of A Satellite Downlink Power Budget, Rain Margin, Unavailability and Carrier-to-Interference Ratio

A. Inputs		
Satellite longitude	degrees	119.0
Earth station latitude and longitude (lat/long)	degrees	38.90/77.01
Earth station altitude above mean sea level	km	0.01
Satellite e.i.r.p. in the direction of the DBS earth station	dBW	52.6
Operating frequency	GHz	12.45
Required operating threshold	dB	6.1
Receiver noise bandwidth	MHz	24.0
Earth station antenna diameter	m	0.45
Earth station antenna pointing loss towards the satellite	dB	0.5
Clear-sky earth station antenna system noise temperature	Kelvin	85.0
Atmospheric absorption	dB	0.2
C/I for other assignments in the BSS Plan	dB	20.0
Clear-sky feeder link C/(N+I)	dB	26.2
Boltzman's constant	dB	228.6
B. Calculate		
Distance from GSO satellite to earth station	km	38,825
Earth station antenna elevation angle	degrees	27.6
Free space path loss	dB	206.1
Earth station antenna gain	dB _i	33.83
Clear-sky earth station antenna G/T	dB	14.5
Clear-sky carrier-to-thermal noise ratio	dB	15.1
Clear-sky carrier-to-thermal noise plus interference ratio	dB	13.6
Clear-sky link margin	dB	7.5
Rain margin	dB	4.08
Satellite link unavailability due to rain	%	0.0843
Calculated satellite link availability	%	99.9157
Acceptable increase in unavailability due to terrestrial service interference	%	2.86
Equivalent unavailability due to rain and terrestrial interference	%	0.0867
Equivalent rain margin	dB	4.018
Rainy sky C/I for the terrestrial service interference	dB	22.9

APPENDIX I – PROPOSED MVDDS/DBS SHARING ARRANGEMENT AND COMPUTATION OF THE MVDDS/DBS REMEDIATION ZONE

We propose to define “mitigation zones” in each geographic area by describing an interference contour centered around a terrestrial transmitter beyond which rain outages to DBS subscribers in the presence of MVDDS operations do not exceed normal rain outages by more than a predetermined amount. This mitigation zone would be defined by an MVDDS carrier to interference (C/I) ratio, using each MVDDS transmitter site as the center of the plot, and the rain prediction procedures described in ITU-R Recommendation P.618-6. As discussed in the *Further Notice*, the criteria for determining the C/I and thus the size of the mitigation zone can be based on a percentage or minute increase in unavailability in an average year or in the worst-month.

Inside each mitigation zone, the MVDDS provider would be responsible for fixing complaints of outages beyond the parameters defined in the *First R&O* and repeated above. Mitigation of complaints can be accomplished by, but are not limited to, the following techniques: shielding, relocating, or upgrading DBS receive antennas.

As detailed in Appendix H, the acceptable C/I ratio is based on an increase of the unavailability of the DBS link in a rainy environment. This appendix provides an example of constructing the mitigation zone based on a given C/I ratio. The size and the shape of that zone depend on many elements, which are identified below. We note that the record in this proceeding indicates that interested parties have developed similar methods of calculating mitigation zones.²⁶

In a static DBS-terrestrial environment, the carrier-to-interference ratio is generally described by:²⁷

$$C/I = \frac{E.I.R.P._{sat} - BTL_{sat} - ATM - MIS - RAIN + GM_{dbs}}{(E.I.R.P._{ts} + G_{ts}(\zeta) - BTL_{ts} + G_{dbs}(\phi) - XP_{dbs}) + 10 \log(BWR)} \quad (1)$$

where:

- E.I.R.P._{sat} = the DBS satellite E.I.R.P. in the direction of the desired earth station, dBW
- BTL_{sat} = the basic transmission loss from the space craft to the desired earth station, dB
- ATM = the atmospheric gaseous absorption at 12.45 GHz, dB
- MIS = the DBS receiving antenna mispointing loss, dB
- RAIN = the rain margin of the DBS service at the desired earth station location, dB
- GM_{dbs} = the maximum gain of the DBS receiving antenna, dBi
- E.I.R.P._{ts} = the terrestrial service maximum E.I.R.P., dBW
- G_{ts}(ζ) = the terrestrial transmit antenna relative gain (normalized) in the direction of the DBS receiver, dBi
- BTL_{ts} = the basic transmission loss from the terrestrial transmitter to the DBS receiver, dB
- G_{dbs}(φ) = the DBS receiving antenna gain in the direction of the terrestrial transmitter, dBi
- XP_{dbs} = the DBS receiving antenna sidelobe polarization isolation, dB
- BWR = the ratio of the terrestrial emission bandwidth and the DBS emission bandwidth.

²⁶ *Ex Parte* presentation of Northpoint at Exhibit C, March 17, 2000 and DIRECTV Report, January 27, 2000.

²⁷ It should be noted that this equation is based on direct wave propagation (*i.e.*, line-of-sight or free space) and neglects the contribution of multipath or obstructions.

The basic transmission loss (*i.e.*, free space propagation loss) is given by the equation:

$$32.44 + 20 \log(F) + 20 \log(D) \quad (2)$$

where:

- F = the operating frequency (F) is expressed in megahertz; and
- D = the distance between the transmitter and the receiver expressed in kilometers

For the purpose of this example, we assume the following values for parameters identified in equation (1):

- F = 12450 MHz, (*i.e.*, the middle of the 12.2-12.7 GHz band);
- ATM = 0.2 dB (absorption due to atmospheric gases (oxygen and water vapor));
- MIS = 0.5 dB (DBS antenna mispointing loss);
- BWR = 1 (bandwidth ratio);
- GM_{db} = 33.83 dBi (for a typical 45-cm diameter antenna); and
- XP_{db} = 0 dB (DBS antenna sidelobe polarization isolation).

Therefore, from equations (1) and (2), the separation distance (D_{ts}) between the terrestrial transmitter and the DBS receiver where the C/I equals the acceptable value can be derived:

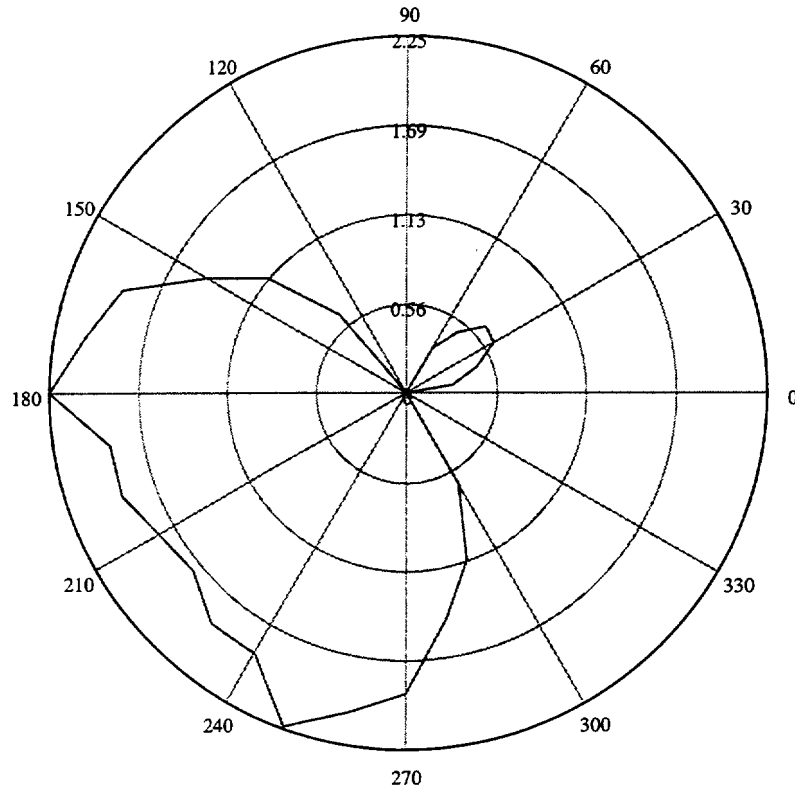
$$20 \log(D_{ts}) = C/I - E.I.R.P._{sat} + G_{db}(\phi) + E.I.R.P._{ts} + G_{ts}(\zeta) + 20 \log(D_{sat}) + RAIN - 33.13 \quad (3)$$

Equation (3) reflects the fact that the size and the shape of the mitigation zone are highly dependent on the DBS receiving antenna pattern and the MVDDS transmitter antenna pattern. Using equation 3 and the parameters contained in the following table, we show an example mitigation zone in Figure I-1. This mitigation zone is drawn for a DBS earth station located in Washington, DC receiving a signal from the DBS satellite located at 101° W.L.

Earth station location	Degrees		38.898 Latitude, 77.009 Longitude
Height of the terrestrial antenna	m		100
Carrier-to-interference ratio	dB	C/I	15.9
DBS satellite e.i.r.p.	dBW	E.I.R.P. _{sat}	52.4
DBS earth station antenna pattern		G _{db} (φ)	DIRECTV, April 11, 1994
Terrestrial antenna maximum e.i.r.p.	dBW	E.I.R.P. _{ts}	-17.5
Terrestrial transmitter antenna pattern		G _{ts} (ζ)	Northpoint, March 17, 2000
Distance to the DBS satellite	km	D _{sat}	37900
Rain attenuation	dB	RAIN	4.47

Figure I-1

Example mitigation zone for Washington, DC from DBS satellite located at 101° WL. It should be noted that, in the detailed calculation, the DBS receiving antenna pattern should include the effect of frequency at 12.2 GHz, 12.45 GHz, and 12.7 GHz. Similarly, the terrestrial antenna relative gain should also include the effect of frequency in both the azimuth and elevation gains.



**APPENDIX J: UNAVAILABILITY STATISTICS FOR INCREASES IN DBS OUTAGES OF 2.86%, 60 MINUTES, AND 30 MINUTES
ANNUALLY (45 cm antenna)**

Unavailability Statistics for DIRECTV Satellite at 101° W.L for Top Markets (Statistics computed using inputs as listed in Appendix G and the method described in Appendix H)										
Market	Average Yearly Statistics		Increased Outage = 2.86%				Increased Minutes of Outage = 60 min.		Increased Minutes of Outage = 30 Min.	
	Percentage of Availability	Minutes of Outage	Percentage of Availability	Minutes of Outage	Increased Minutes of Outage	Change in Percentage of Availability	Change in Percentage of Availability = 0.0114 %		Change in Percentage of Availability = 0.0057 %	
							Percentage of Availability	Minutes of Outage	Percentage of Availability	Minutes of Outage
New York	99.9466	280.7	99.9451	288.6	7.9	0.0015	99.9352	340.7	99.9409	310.7
Los Angeles	99.9731	141.4	99.9723	145.6	4.2	0.0008	99.9617	201.4	99.9674	171.4
Chicago	99.9637	190.8	99.9627	196.2	5.4	0.0010	99.9523	250.8	99.9580	220.8
Philadelphia	99.9567	227.6	99.9555	234.1	6.5	0.0012	99.9453	287.6	99.9510	257.6
San Francisco	99.9364	334.3	99.9346	343.8	9.5	0.0018	99.9250	394.3	99.9307	364.3
Boston	99.9578	221.8	99.9566	228.1	6.3	0.0012	99.9464	281.8	99.9521	251.8
Washington, DC	99.9582	219.7	99.9570	226.0	6.3	0.0012	99.9468	279.7	99.9525	249.7
Dallas	99.8332	876.7	99.8284	901.8	25.1	0.0048	99.8218	936.7	99.8275	906.7
Detroit	99.9501	262.3	99.9487	269.8	7.5	0.0014	99.9387	322.3	99.9444	292.3
Atlanta	99.9475	275.9	99.9460	283.8	7.9	0.0015	99.9361	335.9	99.9418	305.9
Houston	99.7823	1144.2	99.7761	1177.0	32.8	0.0062	99.7709	1204.2	99.7766	1174.2
Seattle	99.8814	623.4	99.8780	641.2	17.8	0.0034	99.8700	683.4	99.8757	653.4
Cleveland	99.9352	340.6	99.9333	350.3	9.7	0.0019	99.9238	400.6	99.9295	370.6
Minneapolis	99.9506	259.6	99.9492	267.1	7.5	0.0014	99.9392	319.6	99.9449	289.6
Tampa	99.8644	712.7	99.8605	733.1	20.4	0.0039	99.8530	772.7	99.8587	742.7
Miami	99.8242	924.0	99.8192	950.4	26.4	0.0050	99.8128	984.0	99.8185	954.0
Phoenix	99.9385	323.2	99.9367	332.5	9.3	0.0018	99.9271	383.2	99.9328	353.2
Denver	99.9896	54.7	99.9893	56.2	1.5	0.0003	99.9782	114.7	99.9839	84.7
Pittsburgh	99.9576	222.9	99.9564	229.2	6.3	0.0012	99.9462	282.9	99.9519	252.9
Sacramento	99.9229	405.2	99.9207	416.8	11.6	0.0022	99.9115	465.2	99.9172	435.2
St. Louis	99.9570	226.0	99.9558	232.5	6.5	0.0012	99.9456	286.0	99.9513	256.0
Orlando	99.8543	765.8	99.8501	787.7	21.9	0.0042	99.8429	825.8	99.8486	795.8
Portland	99.9122	461.5	99.9097	474.7	13.2	0.0025	99.9008	521.5	99.9065	491.5
Indianapolis	99.9458	284.9	99.9442	293.0	8.1	0.0016	99.9344	344.9	99.9401	314.9
San Diego	99.9817	96.2	99.9812	98.9	2.7	0.0005	99.9703	156.2	99.9760	126.2
Charlotte	99.9577	222.3	99.9565	228.7	6.4	0.0012	99.9463	282.3	99.9520	252.3
Cincinnati	99.9410	310.1	99.9393	319.0	8.9	0.0017	99.9296	370.1	99.9353	340.1
Kansas City	99.9642	188.2	99.9632	193.5	5.3	0.0010	99.9528	248.2	99.9585	218.2
Milwaukee	99.9486	270.2	99.9471	277.9	7.7	0.0015	99.9372	330.2	99.9429	300.2
Nashville	99.9625	197.1	99.9614	202.7	5.6	0.0011	99.9511	257.1	99.9568	227.1
Columbus	99.9634	192.4	99.9624	197.9	5.5	0.0010	99.9520	252.4	99.9577	222.4
Greenville	99.9378	326.9	99.9360	336.3	9.4	0.0018	99.9264	386.9	99.9321	356.9

Unavailability Statistics for EchoStar Satellite at 119° W.L for Top Markets
(Statistics computed using inputs as listed in Appendix G and the method described in Appendix H)

Market	Average Yearly Statistics		Increased Outage = 2.86%				Increased Minutes of Outage = 60 Min.		Increased Minutes of Outage = 30 Min.	
	Percentage of Availability	Minutes of Outage	Percentage of Availability	Minutes of Outage	Increased Minutes of Outage	Change in Percentage of Availability	Change in Percentage of Availability = 0.0114 %		Change in Percentage of Availability = 0.0057 %	
							Percentage of Availability	Minutes of Outage	Percentage of Availability	Minutes of Outage
New York	99.9406	312.2	99.9389	321.1	8.9	0.0017	99.9292	372.6	99.9349	342.2
Los Angeles	99.9293	371.6	99.9273	382.2	10.6	0.0020	99.9179	431.6	99.9236	401.6
Chicago	99.9243	397.9	99.9221	409.3	11.4	0.0022	99.9129	457.9	99.9186	427.9
Philadelphia	99.9328	353.2	99.9309	363.3	10.1	0.0019	99.9214	413.2	99.9271	383.2
San Francisco	99.8544	765.3	99.8502	787.2	21.9	0.0042	99.8430	825.3	99.8487	795.3
Boston	99.9301	367.4	99.9281	377.9	10.5	0.0020	99.9187	427.4	99.9244	397.4
Washington, DC	99.9157	443.1	99.9133	455.8	12.7	0.0024	99.9043	503.1	99.9100	473.1
Dallas	99.6790	1687.2	99.6698	1735.4	48.2	0.0092	99.6676	1747.2	99.6733	1717.2
Detroit	99.9407	311.7	99.9390	320.6	8.9	0.0017	99.9293	371.7	99.9350	341.7
Atlanta	99.8431	824.7	99.8386	848.3	23.6	0.0045	99.8317	884.7	99.8374	854.7
Houston	99.5827	2193.3	99.5708	2256.1	62.8	0.0119	99.5713	2253.3	99.5770	2223.3
Seattle	99.7127	1510.0	99.7045	1553.2	43.2	0.0082	99.7013	1570.0	99.7070	1540.0
Cleveland	99.9209	415.7	99.9186	427.6	11.9	0.0023	99.9095	475.7	99.9152	445.7
Minneapolis	99.9289	373.7	99.9269	384.4	10.7	0.0020	99.9175	433.7	99.9232	403.7
Tampa	99.6911	1623.6	99.6823	1670.0	46.4	0.0088	99.6797	1683.6	99.6854	1653.6
Miami	99.5880	2165.5	99.5762	2227.4	61.9	0.0118	99.5766	2225.5	99.5823	2195.5
Phoenix	99.8337	874.1	99.8289	899.1	25.0	0.0048	99.8223	934.1	99.8280	904.1
Denver	99.9793	108.8	99.9787	111.9	3.1	0.0006	99.9679	168.8	99.9736	138.8
Pittsburgh	99.9439	294.9	99.9423	303.3	8.4	0.0016	99.9325	354.9	99.9382	324.9
Sacramento	99.8231	929.8	99.8180	956.4	26.6	0.0051	99.8117	989.8	99.8174	959.8
St. Louis	99.8052	1023.9	99.7996	1053.2	29.3	0.0056	99.7938	1083.9	99.7995	1053.9
Orlando	99.6616	1778.6	99.6519	1829.5	50.9	0.0097	99.6502	1838.6	99.6559	1808.6
Portland	99.8769	647.0	99.8734	665.5	18.5	0.0035	99.8655	707.0	99.8712	677.0
Indianapolis	99.8722	671.7	99.8685	690.9	19.2	0.0037	99.8608	731.7	99.8665	701.7
San Diego	99.9490	268.1	99.9475	275.7	7.6	0.0015	99.9376	328.1	99.9433	298.1
Charlotte	99.8933	560.8	99.8902	576.9	16.1	0.0031	99.8819	620.8	99.8876	590.8
Cincinnati	99.9004	523.5	99.8976	538.5	15.0	0.0028	99.8890	583.5	99.8947	553.5
Kansas City	99.8965	544.0	99.8935	559.6	15.6	0.0030	99.8851	604.0	99.8908	574.0
Milwaukee	99.9190	425.7	99.9167	437.9	12.2	0.0023	99.9076	485.7	99.9133	455.7
Nashville	99.9157	443.1	99.9133	455.8	12.7	0.0024	99.9043	503.1	99.9100	473.1
Columbus	99.9091	477.8	99.9065	491.4	13.6	0.0026	99.8977	537.8	99.9034	507.8
Greenville	99.8513	781.6	99.8470	803.9	22.3	0.0043	99.8399	841.6	99.8456	811.6

**SEPARATE STATEMENT OF COMMISSIONER HAROLD FURCHTGOTT-ROTH,
Approving in Part, Dissenting in Part**

Re: Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range; et al, ET Docket No. 98-206 (Adopted November 29, 2000).

Today's item is an important milestone in what has been a very long road. Our Order paves the way for implementation of the historic sharing agreement reached between the incumbent geostationary orbit ("GSO") satellite systems and the new non-geostationary orbit ("NGSO") satellite providers. Extensive negotiations carried out over two World Radio Conferences and thousands of hours of public and private talks have paved the way for these new services. The Commission and the parties should take great pride in the final result. Similarly today's Order concludes that sharing between these satellite providers and a terrestrial service is possible in the 12.2-12.7 GHz band. Here too potential licensees have worked for years for this day, and I am pleased that we can move forward to the next stage of our deliberations.

This entire process, however, does raise significant spectrum management issues. Although my concerns in this area do not rise to the level of a dissent, this proceeding should provide a catalyst for an important dialog about the nature and extent of spectrum usage rights granted by FCC licenses.

Finally, I do part ways with my fellow commissioners on some discrete issues related to the Further Notice. I am highly skeptical of any proposal to restrict the ownership of new licenses. Similarly any discussion of mandating a particular kind of service – or importing the regulatory burdens associated with particular services – is inconsistent with the FCC's general policy direction and contrary to my own regulatory philosophy.¹ Due to the majority's decision to consider so actively these restrictive and highly regulatory options, I respectfully dissent in part.

The Commission's Licensing Approach

The questions presented by this proceeding are complicated and difficult. Ultimately the staff has done a good job of balancing these interests. However, I believe it is important to look at some of the larger issues raised by this proceeding.

First, what spectrum usage rights do FCC licensees have? As I noted in our recent secondary markets proceeding, often licensees do not know exactly what rights they have – making it difficult for licensees to sell some or all of those rights to third parties.² Here GSO direct broadcast satellite ("DBS") licensees were originally granted certain spectrum usage rights – some of which they paid for at auction – at a time when sharing was not contemplated. Parties sought these licenses, and paid for these licenses,

¹ See Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium, Policy Statement (rel. Nov. 22, 1999) (trumpeting the goal of flexibility); Principles for Promoting the Efficient Use of Spectrum by Encouraging the Development of Secondary Markets, Policy Statement (rel. December 1, 2000).

² Principles for Promoting the Efficient Use of Spectrum by Encouraging the Development of Secondary Markets, Policy Statement (rel. December 1, 2000)(discussing the need to clarify spectrum usage rights); see also Separate Statement of Commissioner Harold Furchtgott-Roth in that proceeding.

with expectations of certain interference protection and with expectations on the range of technological options with which the spectrum might be developed³. The amount these parties were willing to pay for licenses was based on these expectations. Thus GSO DBS licensees paid for one set of rights – exclusive use of space stations in these bands with expectations of certain interference protection – but are now only entitled to a diminished version of those rights. This change has come without compensation for the alterations in interference protection or the reduced range of technological possibilities or the expenses incurred by GSO DBS in acquiring and developing the licenses. By this Order, NGSO licensees will share these rights with GSO DBS. And not only will they share, DBS's system-wide reliability will be diminished by these NGSO systems. Moreover, the FCC determines here that it is technically feasible for DBS to share with a terrestrial system, under parameters yet to be developed.

Perhaps such unpredictability is the best we can do; licensees will inevitably not know how or when the Commission will alter their rights (even those they pay for). But to the extent the Commission maintains complete discretion to alter such core terms of a license, we cannot expect the primary and secondary spectrum markets to function well. Perhaps that is a trade off we should make, but the FCC has never tackled the hard questions that surround such a policy. Instead the Commission wants it both ways – complete discretion to change the terms of a license and a fully functioning primary and secondary market. I am convinced we cannot have both.

Similarly changes in our licensing scheme affects both future auctions and commercial development of licenses. Going forward, we must also recognize that our licensing regime creates reasonable reliance interests that cannot and should not be tossed aside. For example, GSO DBS systems were built in order to maintain a certain degree of reliability for customer service. Thus American DBS providers determined that in order to be a successful commercial operation, their service must be highly reliable.⁴ That level of reliability was a commercial decision made by GSO DBS providers based on certain assumptions – I believe reasonably including the “exclusive” rights that were granted pursuant to their original licenses. By today's Order we permit the NGSO systems to increase incrementally the GSO DBS systems' unavailability rate. Our further notice contemplates increasing this outage rate.⁵

Perhaps these increased DBS outages are in the public interest. However, I believe it is licensees, not the FCC, that should be able to determine what availability rates are needed for them to compete effectively in the marketplace. Had DBS known that it would be sharing with two other systems, then excess interference “cushion” could have been added to the system – or not. That should be a business decision, not a government one. We owe it to our licensees to notify them as soon as practicable – preferably before an auction – of major sharing obligations that could be imposed that may impact their system design and spectrum valuation. Perhaps our failure to do so in some instances provides a basis for declining to introduce additional sharing into a band.

The major spectrum issues raised by this proceeding are not limited to the GSO DBS providers. The proposed terrestrial Northpoint service has also traveled a difficult road at the Commission. There is no question that Northpoint has expended substantial resources in navigating the shoals of the U.S.

³ In this regard, incumbent GSO FSS operators were granted similar rights with expectations of certain interference protections that are also altered by this order, however these licenses were distributed without an auction.

⁴ Order at ¶ 213.

⁵ Moreover, such a policy creates a perverse incentive for licensees: build fragile systems that cannot withstand additional interference and you may not have to share. The agency must be wary not to send the wrong signals to its licensees.

regulators in order to make today's order possible. Despite fighting most of those battles alone, today additional terrestrial licensees are understandably also interested in the 12.2-12.7 GHz band. This type of regulatory "free rider" problem is far from unique and certainly not improper – but it does significantly diminish the incentive for parties to "pave the way."

In this regard, I am intrigued by the logical consequences of a concept advanced by Northpoint regarding the Commission's licensing process. Northpoint is understandably troubled by having a service-specific DBS licensing proceeding, followed years later by a NGSO "satellite" filing window, and then finally a possible terrestrial auction. Northpoint believes that its terrestrial application, filed in the NGSO satellite window, should have the same rights as its fellow applicants in that filing window.⁶

Northpoint's approach ultimately suggests that the FCC should license all uses for a given band at once. Thus we would have a single integrated 12.2-12.7 GHz band proceeding. That proceeding would open a filing window for all uses of the band – and sort out the scope of each license all at once. But regardless of whom filed, all of the commercial rights in the band could be handed out in one proceeding.⁷ Thus, for example, if GSO DBS had been the only party to file in this band – they would have been granted exclusive and comprehensive rights to the band for all services subject only to our interference rules, etc. In this regime, if the NGSO systems or terrestrials subsequently wished to share this band, they would go to the GSO DBS providers and negotiate a commercial sharing arrangement with appropriate compensation. The Commission's role would be limited largely to referee. This provides an intriguing alternative regulatory model.

In the end, this proceeding has been a product of our current rules – not some conceivably more desirable future policies. In that context, the Commission has attempted to balance many interests and concerns – including those described above. However, our challenge rests not just in recognizing these issues, but in crafting prospective policies that will save the Commission from these troubling and countervailing interests in the future.

Distressing Service Rules Proposals

I am troubled by two aspects of today's order: (1) the proposal to prevent GSO DBS operators and incumbent in-region cable operators from acquiring MVDDS licenses,⁸ and (2) any effort to require a particular service in a given band or to extend legacy regulations to new services.⁹

Barring certain parties from participating in an auction is a draconian measure that should not be pursued absent extraordinary circumstances. There is little basis for pursuing such a policy here. First we have no clear idea about the types of services that may be offered by multi-channel video distribution and data service (MVDDS) licensees. Perhaps they will offer video, perhaps only data. Therefore today it's not clear whom these licensees will be competing against, making any auction bar purely speculative. Second, there are countless competitors in the video marketplace and several competitors in the niche

⁶ Nonetheless Northpoint's terrestrial sharing arrangements would be substantially different from those of the satellite applicants.

⁷ Such an approach would invariably reflect only the technology available at the time of licensing. However, it is not necessarily clear that the Commission can best make available shared spectrum, rather than licensees themselves recognizing the potential value of a new shared use.

⁸ Order at ¶¶ 299-301.

⁹ Order at ¶¶ 289-292.

multi-channel video programming distribution (MVPD) marketplace. It is difficult to imagine that these providers could collude to buy up this spectrum and allow it to remain fallow. Third, in some cases, the contemplated ownership prohibition may eliminate the exact type of competitive entry such restrictions are purportedly designed to foster. For example, barring incumbent cable providers may ultimately undermine competitive cable service. A cable provider may serve only a portion of an auctioned license area and may wish to use MVDDS spectrum and its existing personnel and infrastructure to expand the reach of its service to a neighboring area. Such expansion may create the desired competitive presence. Similarly cable providers may use MVDDS to supply multi-channel video service to portions of their service area that are not economical to reach via wireline cable plant. The FCC should not foreclose these or other business models from taking root in this band.

Finally, I cannot help but recall the Commission's most recent foray into restricted eligibility for a new service: LMDS.¹⁰ There, as here, the FCC anticipated that LMDS would offer certain services. There, as here, the Commission proposed to bar incumbents from participating in the auction. There the FCC adopted the restriction and years later the service had barely gotten off the ground. Here I hope we don't make the same mistake.

I also wish to caution my colleagues against requiring any particular type of service in the 12.2-12.7 GHz band. Although certain applicants have put forth a business model that includes video programming, I am opposed to requiring any particular service. That is a decision best left to the marketplace. Similarly, I would oppose importing regulatory burdens, such as must-carry obligations, onto new service providers in these bands. New entrants should be given maximum flexibility to utilize the spectrum in the way they deem fit with minimal interference from the Commission.

* * *

Today's order strikes a good balance of the interests in these bands. But the Order also reflects many of the challenges that our current spectrum policy has created and that our future spectrum policy will need to resolve.

¹⁰ See e.g. Concurring Statement of Commissioner Harold Furchtgott-Roth in Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, Third Report and Order and Memorandum Opinion and Order, CC Docket No. 92-297 (rel. June 26, 2000); see also *See Dissenting Statement of Commissioner Harold Furchtgott-Roth*, in Third Order on Reconsideration, Sixth Notice of Proposed Rulemaking, CC Docket 92-297 (Dec. 13, 1999); *Statement of Commissioner Rachelle B. Chong, Dissenting in Part*, Second Report and Order, Order on Reconsideration and Fifth Notice of Proposed Rulemaking, CC Docket No. 92-297 (March 11, 1997).

Separate Statement of Commissioner Gloria Tristani

Re: Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range; Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates; Applications of Broadwave USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. To Provide A Fixed Service in the 12.2-12.7 GHz band

I write separately on two counts. First, I support the steps we take today to allow more services into the Ku-band. With the allocations and spectrum sharing approach we undertake here, there will new opportunities to deploy exciting services to consumers across the nation. Interested parties offer great promise for extending the reach of broadband services and providing new alternatives for the delivery of video programming services including local television signals. While today's action represents several important determinations, additional steps are necessary before the promise of these services becomes reality. I look forward to further action in this regard.

Second, I wish to recognize the dedication and commitment of the Commission's engineers, lawyers, and economists who have done extraordinary work in this proceeding. Many of the policies and proposals made here represent extremely complex spectrum sharing arrangements. Throughout the lengthy period of negotiations with the parties, at international fora, and in reviewing the hundreds and hundreds of filings in the record, Commission staff have sought ways to share spectrum that allow deployment of new services without causing any unreasonable intrusion into the services of existing licensees. With this Order and Further Notice, I believe we have set a course to do just that. Our work is far from over, but I commend our staff for their undertakings thus far.